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INSTRUCTIONS

FOR

OPERATORS

OF

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J. B. AIKEN'S

PORTABLE

FAMILY KNITTING MACHINE

WITH ILLUSTRATIONS.

NEW YORK:
BAPTIST & TAYLOR, STEAM JOB PRINTERS,
"Sun Building," cor. Fulton and Nassau Sts.
1861.



INSTRUCTIONS
FOR
OPERATORS
OF
J. B. AIKEN'S
FAMILY KNITTING MACHINE.

EXPLAINING THE MANNER IN WHICH THE GOODS ARE
FINISHED UP, THE MACHINE KEPT IN ORDER,
&c., &c.

Solely for the use of those Purchasing a Machine.

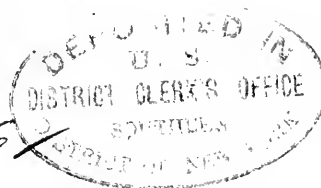
Manufactory, Franklin, N. H.

New York:

BAPTIST & TAYLOR, STEAM JOB PRINTERS, SUN BUILDING.
1861.

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Jan. 2. 1861

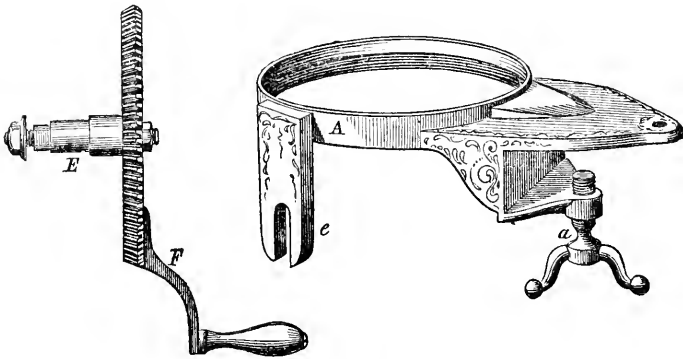


Entered according to Act of Congress, in the year 1860, by
J. B. AIKEN,
in the Clerk's Office of the District Court of the United States,
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14-4-5405

ILLUSTRATIONS,
SHOWING THE
DIFFERENT PARTS OF THE MACHINE,
TOGETHER WITH AN

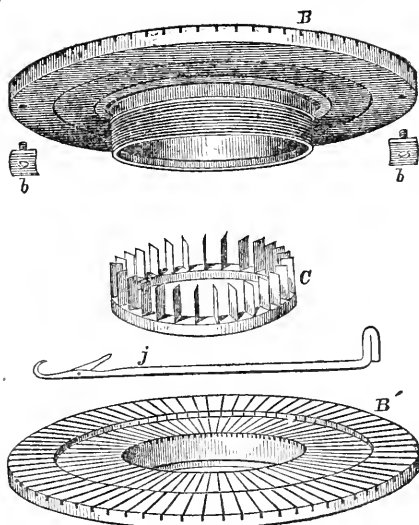
Explanation of the Manner in which they are Adjusted.



(FIG. 1.)

A is a ring, combined to a clamp, which is made fast to the edge of an ordinary table by the thumb-screw *a*. To this ring all the operating parts of the machine are attached. F is the driving-gear by which all the operating parts of the machine are *actuated*.

This gear revolves on the axle or stud E, which is secured to the projection *e* by an ordinary nut.



(FIG. 2.)

B is a perspective view of the *under* side of the needle-plate, showing the flanch or projection, with a thread or screw cut upon its outer surface, by which it is secured to the ring A. *b b* are straps which are attached to the under side of the needle-plate by two small screws. The outer edges of these straps enter a groove in the flanch of the *cam-plate*, and are for keeping the cam-plate from rising up from the needle-plate when the machine is in operation. The sectional view (Fig. 6, page 11) clearly illustrates the manner in which they are adjusted.

B' is a perspective view of the upper side of the needle-plate, showing the grooves in which the needles are inserted. The needles have a lateral movement in these grooves, and are actuated by means of the two cams of the needle-plate, *n* and *r* (shown in Fig. 3, page 6.)

j is the needle used in this machine which is known as the *latch needle*. One end of this needle is bent at

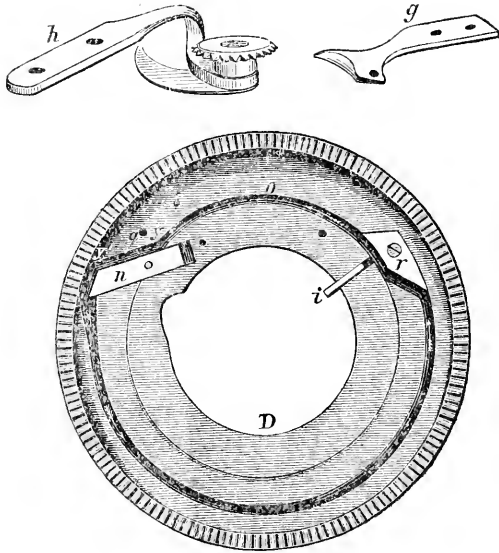
right angles with the body or straight part. This bent end we term the *shank* of the needle. It is by this bent end or shank coming in direct contact with the two inclined cams *n* and *r*, alternately, that the *lateral movement* is transmitted to the operating end of the needle, which is required when knitting.

The operating end of the needle consists of a hook and latch. The latch is secured in a slot, cut in the body of the needle, by a rivet which passes through the body of the needle and the lower end of the latch.

The latch is operated solely by the yarn. When the latch is swung forward, so as to bear upon the hook of the needle, the *point* of the hook should enter the small spoon-shaped cavity in the end of the latch.

C is the sinker ring.

The *sinkers* are thin plates of steel, the lower ends of which are secured to the sinker ring. The upper ends of the sinkers pass up between the needles, holding back the knit fabric, while each needle draws its loop. The sinkers being thin and elastic, spring sideways when a knot or uneven place in the yarn passes through the eye of the carrier-needle, thereby allowing them to draw in through the fabric so as to form new loops without making holes or imperfections in the work.



(FIG. 3.)

D is the cam-plate, in which are shown the two cams *n* and *r*, also the groove *o*, through which the shanks of the needles pass when the machine is in operation. The direction in which the shanks pass, when the cam-plate revolves, is represented by *three arrows*. As the shanks of the needles pass up the advancing cam *r*, the working end of the needle moves towards the centre of the machine; the loop which hangs upon the needle opens the latch—the latch slides through the loop, and the loop falls behind the end of the latch, upon the body of the needle. When the shank of the needle reaches the point *y* of the groove, the retreating cam *n* forces the shank to retreat down the groove to *y'*.

By carefully observing the operation of the machine when it is knitting, it will be found that at this point the needles draw in the yarn and form new loops.

When the shank of the needle has reached the point *y'*, the operating end of the needle is drawn in between

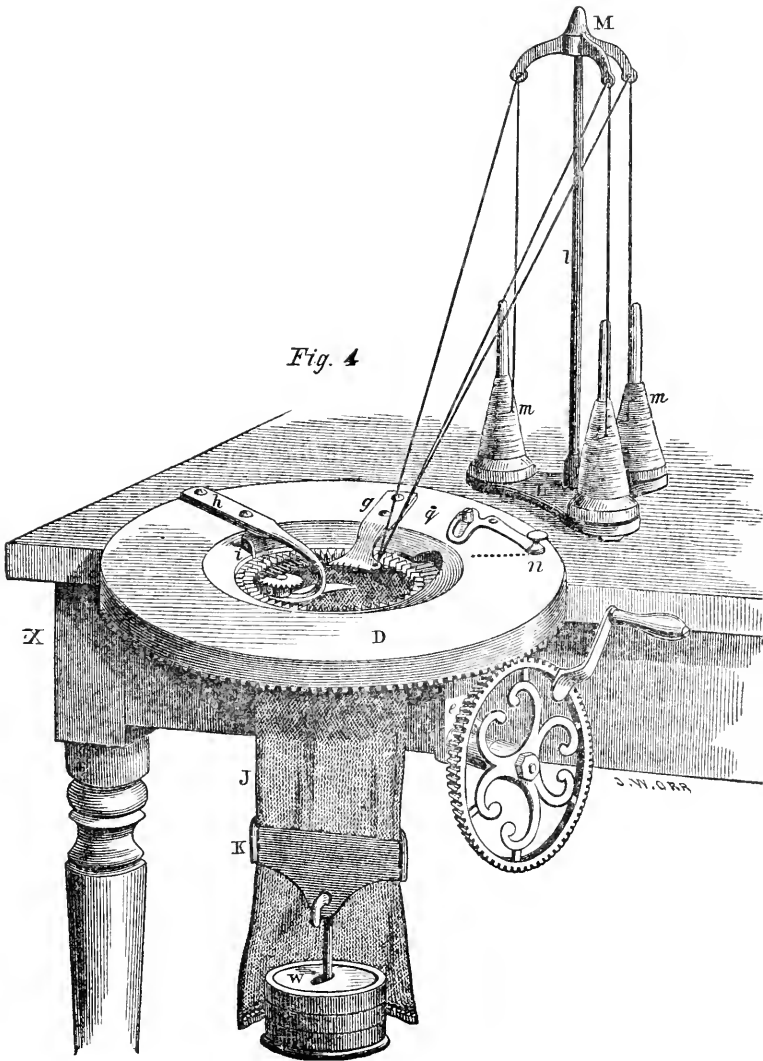
the thin elastic plates of the sinker ring, (described on page 5). *q* is an oil hole through which oil is conveyed, by the tube of the oil can to the needles.

i represents the key *partly drawn out*; this key, when removed, opens a channel through which needles can be inserted into the needle-plate, or removed from it at pleasure.

g is the carrier-needle and latch-regulator combined. It is for guiding the yarn to the hooks of the needles, and also for regulating the latches, should any rebound, so as to close up the hooks during the process of knitting. A detailed account of it will be given under the head of Fig. 5.

h is an arm, the bent end of which supports a spur-wheel which keeps the fabric knit in its proper position against the sinkers, while the needles slide inward, towards the centre of the machine.

The wing which is riveted to the bent arm *h*, just below the spur-wheel, is for keeping the fabric against the sinkers *after* it leaves the wheel, till the needles draw back between the sinkers.



(FIG. 4, on the opposite page,)

Represents the machine *complete*.

The several parts are properly adjusted; the fabric is upon the needles, and the weight and buckle properly attached.

L is the bobbin-stand, which supports the cap M by means of the rod *l*. This rod is made tapering at each end and fits nicely into the cap M, at the upper end, and the stand L at the lower end. The bobbins *m, m, m* are placed upon the pins which are on the upper surface of the bobbin-stand. The stand can be placed in any position convenient to the operator, but should be placed near the machine. The machine is here represented as knitting from *three* bobbins at the same time. But when the yarn is large enough, only *one* bobbin is required to knit from at once. Again—when various colors of yarn are desired to be knit at short intervals apart, different colors of yarn can be placed upon the bobbin-stand, and when a sufficient length of fabric is knit from *one* color the machine is stopped, the yarn broken off midway between the carrier-needle and the cap of the bobbin-stand, and the color of yarn next desired to be knit can be tied to the end attached to the machine, without displacing either of the other two bobbins. This arrangement is found very convenient by practical knitters when knitting undersleeves and other fancy articles.

HOW TO VARY THE LENGTH OF THE LOOP WHEN KNITTING.

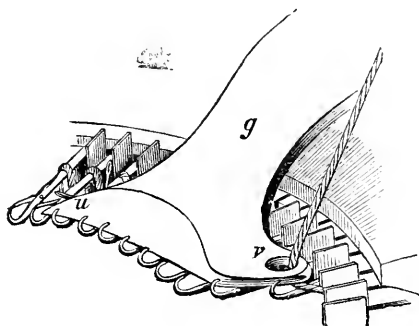
n is an eccentric lever, which acts upon the retreating cam (shown in Fig. 3, Page 6), by means of a screw which passes down through the cam-plate. When a short loop is desired to be knit, the end of the lever is raised a little, and moved towards the centre of the machine; this lever is kept in the position required, by means of a pin on its under surface, which enters one of the holes in the top of the cam

plate. When a longer loop is desired to be knit, the end of the lever should be moved towards the periphery or outer edge of the needle-plate.

HOW TO RAISE THE WEIGHT.

In the process of knitting the fabric J is continually being lengthened and the weight W gradually descends towards the floor. The weight W should always be raised before it reaches the floor, which is done in the following manner:—

Take hold of the fabric J below the buckle K with one hand, and hold the fabric straight downwards, while with the other the buckle K is slipped upwards on the fabric J, and the weight W properly attached.



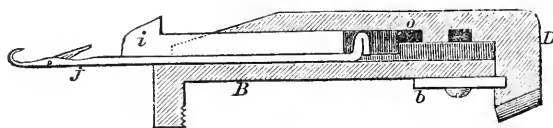
(FIG. 5.)

g is the shank of the carrier-needle, which is attached to the cam-plate, as shown in Fig. 4. The point *u* is for raising the latches when they rebound, so as to close the hooks of the needles. The latches seldom rebound when the cam-plate is revolved slowly, but when its velocity is increased, the action of the latch striking back upon the body of the needle causes them sometimes to *rebound* and close the hook of the needle; were it not for the point entering the hook and raising the latch, the *heel* of the carrier-needle *v* would pass *over* it, and the yarn in such instances could not

be guided into the hook of the needle. Consequently, when the retreating cam drew the needle back between the sinkers, the needle would "drop" the loop which was upon it, and no new one would be formed.

The point of the carrier-needle should always be so adjusted that it will enter the *centre* of the hook, as represented in the cut, and the *heel* of the carrier-needle so adjusted that it will not press down upon the needles, but leave sufficient room for the yarn to pass freely between the under side of it and the needles; but care should be taken not to raise the heel of the carrier-needle too high, for the hooks of the needles will be liable to draw in *below the thread*, and drop the loops which are on the needles.

This explanation is given to enable the operator to properly adjust the carrier-needle should it by carelessness or accident become deranged or misplaced.



(FIG. 6)

Is a sectional view of the cam-plate D, and the needle-plate B, cut in a radial line, *perpendicularly* through them.

The manner in which the straps (referred to in page 4, Fig. 2) are adjusted so as to keep these plates together, is here illustrated.

TO UNSCREW THE NEEDLE-PLATE,

(Reference being had to Fig's 4 and 6), First draw the key *i* partly out of the cam-plate; then, by taking hold of the needle, the *shank* can be drawn out of the operating groove *o*.

Now, by taking hold of the cam-plate D firmly with the right hand, and the opposite edge of the cam-plate with the left, the needle-plate can be unscrewed from the ring A by

pushing *from* you with the right hand, at the same time drawing towards you with the left. When it is desired to screw the needle-plate into the ring A, the cam-plate should be turned in the opposite direction, and screwed firmly down.

TAKING THE MACHINE APART.

(Reference being had to Fig. 4, page 8.) First, break the yarn off close to the carrier-needle; take hold of the fabric J with the left hand, and with the right turn the operating gear twice around; the fabric will then drop off of the needles without further assistance. Then with the left hand (the right still holding the driving-gear) place the wrench upon the nut that holds the stud to the projection *e*, draw the handle towards you, slack the nut, and remove the stud. The arm *h*, which supports the spur-wheel, and also the carrier-needle *g*, can then be removed by taking out the screws that attach them to the cam-plate D. Next, partly draw out the key *i*, and one of the needles (as described in page 11), and unscrew the plate. Then invert the cam-plate, laying it on the table with the flanch of the needle-plate upward, and remove the two straps *b, b*.

The needle and cam-plate can then be easily separated by taking hold of the flanch of the plate and raising it.

By observing these instructions, the most inexperienced person can take the machine apart.

It is not always requisite to remove the arm *h*, or the carrier-needle *g*, in order to take the machine apart, as these parts can be detached afterwards.

DIRECTIONS TO PUT THE MACHINE TOGETHER.

First invert the cam-plate upon the table, replace the needle-plate, and attach the straps *b, b* in their proper places—then invert the plates, insert the *sinker-ring* in the needle-plate, press it gently downwards till it rests upon the small

shoulder upon the inner surface of the flanch—take out the key and insert a needle, as shown in Fig. 6.

Now, take the ring A (seen in Fig. 1), clamp it firmly to the table, insert the flanch of the needle-plate (taking care to hold the plates perfectly horizontal) and screw it firmly down.

The carrier-needle *g*, and the arm *h*, which supports the spur-wheel, should be then adjusted in their proper places. The axle upon which the driving gear revolves should be then attached to the arm *e*, and made fast by the nut. Care should be taken that the teeth of the driving-gear do not *bottom* in those of the cam-plate. Now draw out the key *i* and insert the remainder of the needles. When all parts of the machine are properly adjusted, the cam-plate will revolve freely, by turning the crank of the driving-gear.

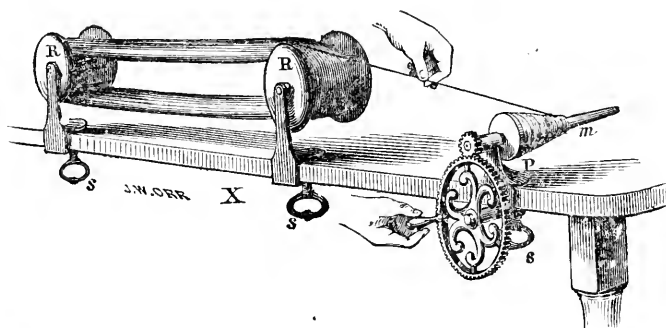
PUTTING THE WORK UPON THE NEEDLES.

After the needles are all inserted in the needle-plate revolve the cam-plate, once around, that the *hooks* of the needles may all be opened.

Now take a piece of knit fabric, such as the operator of these machines is supposed never to be without, unravel one end, so that the loops can be easily taken up with the *working hook*; with the left hand pass the perfect end of the fabric up through the centre of the needle-plate; now hold the end of the fabric near to the heads of the needles, and with the pointed end of the working-hook (the large end being held in the right hand) gently press the loops over upon the hooks of the needles. In this manner the work can be placed upon two-thirds of the needles without revolving the needle-plate; now draw gently down upon the fabric with the left hand, and revolve the machine till a part of the loops which have been placed upon the needles come directly under the eye of the carrier-needle; then, in the same manner, place the loops upon the rest of the needles, and attach the

weight and buckle as represented in Fig. 4, page 8; then pass the yarn through the eye of the carrier-needle—draw it down between the needles for the space of two inches and the machine is ready for operation.

If some of the loops are dropped, in putting the fabric upon the needles, they will *form their own loops upon operating the machine*; but if two needles should knit upon *one* loop, the loop should be taken off of one of the needles, or an additional one placed on *one* of the needles by the point of the working-hook. By revolving the cam-plate once or twice, it will be perceived that each needle has a distinct loop upon it.



(FIG. 7.)

WINDING THE YARN.

It is always desirable to wind the yarn from the skein, upon a bobbin, previous to being knit. For this purpose are supplied the runners R, R, and the winder P. The runners and the winder are attached to the table by the thumb-screws s, s, s. The distance which the runners should be placed apart depends entirely upon the length of the skein it is desired to wind from. The runners can be placed at any desired distance apart, and made secure to the table.

The bobbin *m* should be pressed firmly upon the spindle of the winder—then with the right hand revolve the large

gear, at the same time guide the yarn over the bobbin *m* with the left, as shown in the cut.

A little experience will enable the operator to wind the yarn upon the bobbin in a proper manner.

REMOVING THE NEEDLES.

In the cam-plate *D*, (see. Fig. 4, page 8), is a small key, *i*, which when taken out leaves a channel, through which any needle can be taken out of the needle-plate, or inserted at pleasure, by slowly revolving the cam-plate until this channel comes directly over the needle which it is desired to remove. By this process all of the needles can be taken out of the machine, or inserted, as occasion may require.

If by accident or carelessness of the operator, the latch of a needle should become bent, it should be taken out of the machine at once—straightened, and made to operate easily before replacing it. But should a latch or hook become broken, it should be taken out of the machine and a fresh one inserted. *Always replace the key before operating the machine.*

With proper care a set of needles will last from four to six months, allowing the machine to be in constant operation ten hours each day.

Should purchasers receive needles that require force to move the latch back and forward in the slot, they should return them to the agent, or to the manufacturer, and demand good ones.

Care should be taken to see that the body of the needle is perfectly straight, before it is inserted in the machine.

CLEANING THE MACHINE.

When the machine is in constant operation, it should be taken apart once in three or four weeks, (which is as often as necessary); wipe the needles, the cam-plate, needle-plate

and sinker-ring perfectly clean with cotton waste or cotton cloth, and then replace the several parts as described in page 12.

The oil and lint can be wiped off of the outside of the machine as often as the operator desires, without detaching any part of the machine.

OILING THE MACHINE.

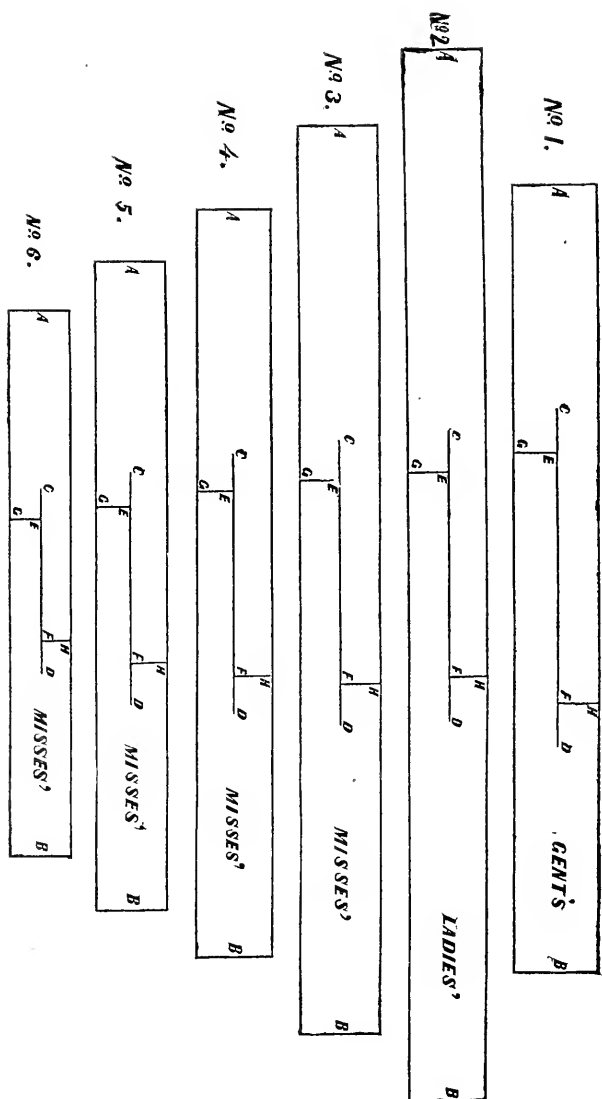
The operating parts of the machine should be kept well oiled. Pure sperm oil should be used when it can be obtained, otherwise use olive oil. The only parts of the machine to be oiled are these: the needles, the stud of the driving-gear and the spur-wheel.

When the machine is in constant operation the needles should be well oiled once a day—especially when heavy work is being knit on the machine. Insert the tube of the oil-can in the oil-hole *q*, in the cam-plate—press upon the bottom of the can, and at the same time revolve the cam-plate slowly, till the needles are sufficiently oiled. The stud upon which the gear revolves can be oiled in the same manner, through a hole in the hub of the gear. A drop of oil should be put upon the *spur-wheel* two or three times a day when the machine is in constant operation.

MAKING VARIOUS SIZES OF STOCKINGS.—Reference being had to *Fig. 8*, page 17.

The gent's and ladies' stockings are knit when the needles are all in the machine. The misses' stockings, No. 3, by taking out every fourth needle. Misses' stockings, No. 4, by taking out every third needle. The two smallest, misses' or children's stockings, Nos. 5 and 6, by taking out every other needle in the machine.

If the operator desires to knit heavy yarn, the end of the loop-regulator should be raised and moved towards the outer



edge of the cam-plate, and when fine yarn is desired to be knit, it should be moved in a reverse direction ; *but care should always be taken to adjust the loop-regulator, so that the hook of the needle can be drawn back through the loops with ease.*

In using fine yarn a much shorter loop can be knit than when coarse yarn is used.

TAPERING THE STOCKING.

This is done with the assistance of the loop-regulator. The foot and ankle should be knit close and firm, then gradually lengthen the loops for the calf of the stocking ; but the usual way adopted by manufacturers is to knit the web in a continuous tubular piece, and then cut the fabric off, of suitable lengths for the hosiery required.

It must be remembered that the length which the fabric is cut off, should, in all cases, correspond with the *size* of the fabric.

Thus, we cannot expect to make a pair of ladies' long hose, from fabric knit under the rule laid down to knit the *smallest misses' hosiery* by.

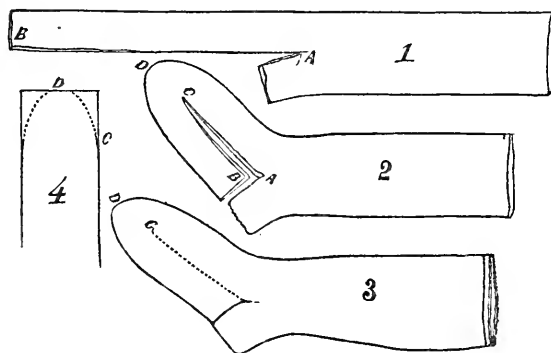
DIRECTIONS FOR CUTTING OUT GENTLEMEN'S HOSE.—Reference being had to *Fig. 8.*

Lay the fabric knit *straight and evenly upon the table*, and cut off a length of 45 inches ; now lay off a distance from A to C and from B to D of $13\frac{1}{2}$ inches.. Also, from D to F and from C to E of $2\frac{3}{4}$ inches. *Mark these points with a crayon or pencil.* Now insert the point of the shears at D, and cut in a straight line to C. Then cut from F to H and from E to G.

In this manner a *pair* of stockings are cut from one length of fabric 45 inches long, without any waste, leaving each stocking as shown at No. 1, in *Fig. 9.*

Ladies' long hose, misses' and children's hose are cut out

of the knit fabric in a similar manner. Below we give the *measurements*.



(FIG. 9.)

Ladies' Long Hose.

Length from A to B, 60 inches; A to C and B to D, 22 inches; D to F and C to E, $2\frac{1}{2}$ inches.

Misses' No. 3.

Length from A to B, 51 inches; A to C and B to D, 15 inches; D to F and C to E, $2\frac{1}{4}$ inches.

Misses' No. 4.

Length from A to B, 42 inches; A to C and B to D, 14 inches; D to F and C to E, 2 inches.

Misses' No. 5.

Length from A to B, 36 inches; A to C and B to D, 12 inches; D to F and C to E, $1\frac{3}{4}$ inches.

Misses' No. 6.

Length from A to B, 32 inches; A to C and B to D, 9 inches; D to F and C to E, $1\frac{1}{2}$ inches.

FINISHING.

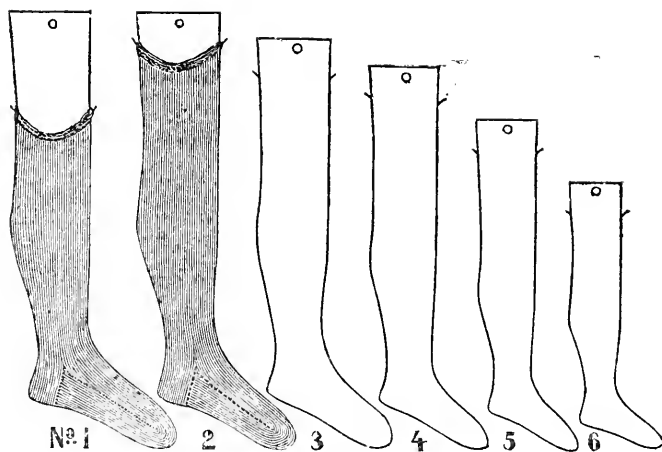
After the stockings are cut out of the fabric in the manner just described, they are seamed up in the following manner, reference being had to Fig. 9.

The end B is brought into the gore A, as shown at diagrams 1 and 2. The stocking is then seamed up with a worsted needle from A to C, and from A to the bottom of the heel. The loops should be then taken up across the bottom of the heel, and fastened with a *button-hole* stitch.

The toe of the stocking is then formed by stitching firmly from C to D, as shown in the diagrams 2, 3 and 4. The toe is then *rounded* by cutting off the corners near the seam, as shown in diagram 4.

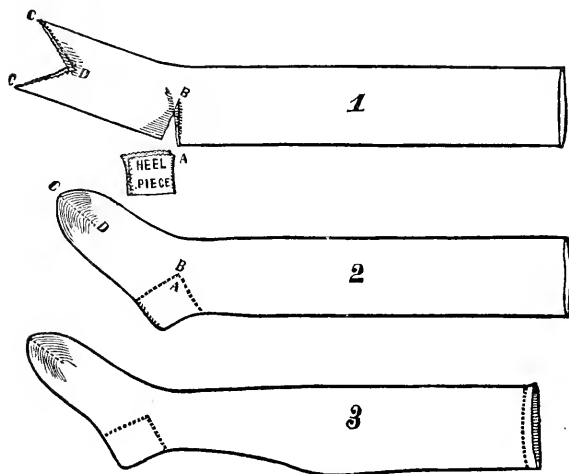
The *top* of the stocking is then finished by turning it in and hemming it down, or the loops can be taken up and crotcheted. The stocking should then be washed, drawn firmly upon one of the stocking boards, (shown in Fig. 10), pinned at the upper end, and allowed to *dry upon it*. They retain the form thus given to them *after* being removed. A sample stocking, finished in this manner, is sent with each machine—together with a set of paper patterns by which the *shape* of the boards can be obtained.

The box in which the portable family knitting machine is packed, being too small to contain the boards, we are compelled to omit them; but full instructions will accompany the patterns, which will enable any ordinary carpenter to construct the same, at a less expense than they can possibly be forwarded to the purchaser.



(FIG. 10.)

The stocking-board No. 1, is used for boarding gent's hose and half-hose; No. 2, for boarding ladies' long hose; Nos. 3, 4, 5 and 6, for boarding misses' and children's hose.



(FIG. 11.)

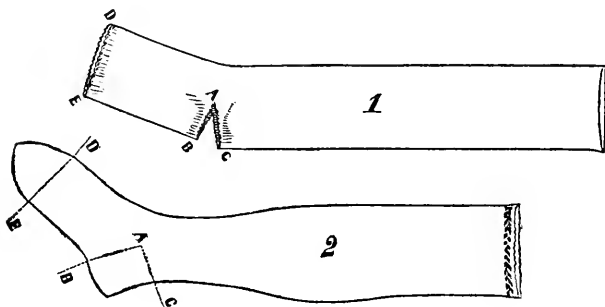
Second Method of Finishing Hosiery.

At the point A, with the point of a knife or pointed scissors, cut one of the loops; now with the end of an ordinary

knitting-needle, unravel the fabric to B; then with a heel-piece cut out of the same material, (one width of the fabric making two heel-pieces), insert the heel-piece into the gore A, then join the loops of the heel-piece with those in the gore of the stocking, as shown at A, B, in diagram 2.

FINISHING THE TOE.

A triangular piece is now cut out of the end of the fabric from C C, to D, as shown in diagram 1; then close up the toe with a needle, as shown at diagram 2. The top of the stocking can be finished in either of the two ways described in the *first* method of finishing hosiery. When washed and boarded they have the appearance as shown in diagram 3.



(FIG. 12.)

Third Method of finishing Hosiery.

First prepare the heel as described in the *second* mode of finishing. The loops are then taken up from A to C, on common knitting needles, and the heel knit in by hand. Now with the worsted needle take up the loops on the side of the gore, from A to B, and close them to the edge of the heel-piece—then close the bottom of the heel as described in the *first* method. The loops on the end of the fabric are then taken up from D to E, and the toe narrowed down by hand. Finish the top in either of the methods before described;

after which, wash and board the stocking in the usual manner.

This is the most expensive way of the three for finishing stockings. But *this* method is a great saving of labor, compared with the usual manner of knitting the *whole* stocking by hand—with this additional advantage—*no hand work can ever compare with it for the uniformity in which it does its work.*

TO KNIT NUBIAN SCARFS.

Fine Shetland worsted of any desired color can be knit into scarfs in the following manner: Attach the weight to the fabric, and adjust the loop-regulator so as to draw a very long loop, and knit the desired length. Then wet the fabric, and stretch it straight and evenly over a thin, smooth board, 10 or 12 inches wide, and 8 or 10 feet long. After it is dry remove it, and finish the end with a fringe to suit your own taste. *Undersleeves* are knit in the same manner, except the ends of the undersleeves should be *contracted*. This can be done by properly adjusting the loop-regulator; but in doing this, care should be taken not to move the regulator abruptly from the longest to the shortest loop, but *observe this rule*: When the end of the lever *n* (see Fig. 4, page 8) is moved *outward* to its utmost limit, and it is desired to knit a *very short loop*, move the end of the loop-regulator half the required distance, towards the centre of the machine; then revolve the cam-plate twice around; now move the loop-regulator the rest of the distance required. The same rule should also be observed in *lengthening* the loop.

The 12 or 18 gage machines are best adapted to make fancy work, and stockings for families. The 10 gage machines, very heavy socks for negroes and laborers, and the 24 gage machines for knitting fine hosiery for ladies and gentlemen.

TO MAKE IMITATION RIBBED WORK.

Take out every third or fourth needle, and proceed with knitting.

A great variety of fancy work can be produced on these machines by different changes of the needles, and by knitting clouded and random yarn; but much depends on the taste, skill and ingenuity of the operator.

No person purchasing a machine should be discouraged if they do not succeed in operating it at first, as they anticipate. But remember that success is the sure reward of perseverance. Any information required concerning these machines or their operation, not contained in this pamphlet, cheerfully given upon application to the manufacturer.

Every machine of my manufacture is guaranteed to be constructed in the most perfect manner.

Every part of the machine is *interchangeable*, and should any part become broken or injured, a similar part can be forwarded, when ordered, by express, or, *if light, by mail*.

Price of Stocking Boards, various sizes (6 in number),	\$. 50
“ extra Bobbin-Stand,	1 00
“ extra Runners, per pair,	1 00

An Oil Can, Screw Driver, Wrench, Working Hook, 20 extra Knitting Needles, and a Worsted Needle accompany each machine. Extra Needles sent by mail, postage *pre paid*. Price, \$5 per 100.

In ordering needles, state the *gage* and *number* of your machine (which you will find stamped upon the top of the cam-plate).

Agents supplied *direct from the manufactory*, with machines and needles. Address

J. B. AIKEN,

Franklin, N. H.

APR. 15. 1861.



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